Testimony Before the Senate Subcommittee on Communications

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Thank you Mr. Chairman and Members of the Committee. It is a pleasure and an honor to be here to speak to you today. My name is Russell Daggatt, and I am President of Teledesic LLC. At Teledesic, we are in the process of building a satellite system that will provide people in every part of the country and the world with affordable access to advanced communications services. I want to convey three messages to this Committee today. First, it is of the utmost importance that this Committee and the government in general continue to promote universal access to advanced telecommunications capability. Second, I will describe how the Teledesic Network's revolutionary new technology will be inherently capable of bringing advanced services to all Americans, no matter where they live, without the need for special regulation or legislation. Finally, I want to encourage this Committee to endorse pro-competitive and forward-looking policies that will allow Teledesic and other advanced service providers to flourish.

As this Committee and other organs of the government consider how to promote advanced telecommunications in accordance with Section 706 of the Communications Act, it is of utmost importance that you continue to support universal access by all Americans and the new technologies that promote it. I want to emphasize to you that this is not just a matter of economic or regulatory significance, but it is of profound social import as well. The policy promoting universal access to telecommunications services in the U.S. is one of the great success stories of modern government. Its power comes from a very contemporary networking principle: The value of a network increases exponentially with the number of nodes in the network. Put another way, the telephone system is made more valuable for everyone by virtue of its ability to reach your grandmother in North Dakota.

For centuries, society has been organized around the economics of infrastructure. With the agricultural revolution, technology — seeds (as in the type you plant) — tied people to the land and brought them together in towns and villages. With the industrial revolution people came together in increasingly congested urban areas, all organized around the economics of industrial infrastructure — wires, rails, highways, pipes, and machinery. To the extent society's new transforming force — the information revolution — is tied to wires, it is just an extension of the industrial age paradigm. Like highways and railways, wires are rigidly dedicated to particular locations. If you live along side the mainline you prosper. If you live a few miles distant, you are left behind.

It is no longer sound — economically or environmentally — to force people to migrate to increasingly congested urban areas in search of opportunity. The real potential of the information age is to find a means of allowing people to choose where they live and work based on things like family, community, and quality of life rather than access to infrastructure. We've done a very good job extending "one-to-many" communications to most of the world. That is what the broadcast technologies are all about. Now, we need to create two-way network links that allow people to participate economically and culturally with the world at large without requiring that they pick up and move to where the infrastructure is.

The convergence of computing and communications is causing all things we associate with a high standard of living — from education and health care to economic development and public services — to become increasingly dependent on the flow of information. In urbanized areas, communications companies are racing to build fiber optic and terrestrial wireless networks to serve the growing demand. But step out of the cities, and these fiber-like telecommunications services become prohibitively expensive or are simply unavailable at any price.

The advantage of a system like Teledesic is that it can provide fiber-like service, but serve locations where fiber cannot economically reach. In fact, the terrestrial fiber networks and the Teledesic network will be complementary to one another. This is because it is just not economical in some situations to lay fiber optic cable in remote areas. Even in densely populated regions, extending the fiber network or even newly developed DSL technology the "last mile" to individual homes and offices may not make economic sense in many cases. The strength of the Teledesic Network is that it will provide universal access at a cost independent of location. It will be no more difficult or costly for Teledesic to serve remote regions of Alaska or Montana than to serve midtown Manhattan or downtown Washington, D.C. In this sense, the Teledesic technology is inherently egalitarian. It will provide universal access that need not be mandated by regulation or legislation. Rather, it is inherent in the nature of the technology that traditionally under-served regions of the country and the world receive the same level and quantity of service as the most developed.

The solution we will bring into being is wireless access to advanced network communications. Unlike wireline technologies, the cost of wireless is largely indifferent to location. But in order to get the bandwidth required for fiber-like service through wireless means it is necessary to operate in a portion of the radio spectrum where sending signals horizontally over land is problematic due to interference caused by rain, terrain, foliage, and buildings. These technical issues limit the ability of cellular, PCS and the various other terrestrial wireless technologies to provide universal access to advanced telecommunications services. The solution the Teledesic Network adopts is simple: send the signals vertically. This leads us to a satellite-based network.

But not all satellite services are alike. Whereas most of today's satellite systems consist of "geostationary" satellites, the Teledesic Network is a low-earth-orbiting (or "LEO") non-geostationary system ("NGSO"). That is a mouthful of satellite jargon, but it is worth taking the time to explain the differences among satellite systems, and the revolutionary capabilities of the new systems. Traditional geostationary satellites ("GEOs") hover over one point on the equator at an altitude of about 22,300 miles. Even at the speed of light, round-trip communications through a geostationary satellite entail a minimum transmission latency — or an end-to-end delay — of approximately one-half second. This "latency" causes the annoying delay in many intercontinental phone calls, impeding understanding and distorting the nuances of speech. What can be an inconvenience on analog voice transmissions, however, can be untenable for videoconferencing and Internet applications. By contrast, the Teledesic satellites will orbit 25 times closer to the Earth than traditional geostationary satellites. Further, the Teledesic Network will consist of 288 satellites moving across the Earth's surface. This "non-geostationary" orbit allows the Teledesic system to provide high quality coverage throughout the world, with low delays, comparable to fiber. And, because Teledesic satellites move in relation to the Earth, continuous coverage of any single point on Earth requires, in effect, global coverage. Teledesic provides the same quality and capacity of service to all parts of the globe on Day One of service.

There are other compelling technical reasons why a LEO system is required in order to ensure universal access to advanced services: they flow from the Internet model, which is an open network that accommodates a whole variety of applications. Closed proprietary networks and application-specific networks do not have much of a future. PCs (whose capabilities are increasing exponentially) are driving the applications that are setting the standards for the networks. In this model, you need to design the network for the most demanding application, not some subset of applications or even the average application.

Without knowing for certain all the applications and data protocols a broadband network will be called upon to accommodate in the 21st century, it is reasonable to assume that those applications will be developed in urban areas — where fiber-optic networks set the standard. To ensure seamless compatibility with these terrestrial broadband networks, a satellite-based broadband access network should be designed with the same essential characteristics as fiber networks — broadband channels, low error rates, and low delays. The idea is that users will not know or care whether their network includes a satellite link, or whether their communication is carried wholly by a fiber optic network.

When you are thinking about the satellite systems of today, it is important to remember that they are not all the same. Before, I mentioned some of the differences between geostationary satellites and low-earth-orbit non-geostationary satellites. Even among low earth orbit non-geostationary satellites, there are three types. The best way of distinguishing among these three LEO system types is by reference to their corresponding terrestrial services:

The so-called “Little LEOs,” like Orbcomm, are the satellite equivalent of paging. They provide simple store-and-forward messaging. These systems offer low data rates but can provide valuable services in a wide range of settings, such as remote monitoring and vehicle tracking.

The so-called “Big LEOs” like Iridium and Globalstar, are the satellite equivalent of cellular phone service. They provide narrowband mobile voice service via satellite, but do not offer bandwidth or functionality comparable to fiber.

Teledesic is the third kind of non-geostationary low-earth orbit system — a broadband LEO system. It will provide the satellite equivalent of fiber, and will provide such services as broadband Internet access, interactive video, and multimedia at access speeds 2,000 times faster than today's standard analog modems. For example, transmitting a set of x-rays may take four hours over one of today's standard modems. The same images can be sent over the Teledesic Network in seven seconds. Due to the Teledesic Network's high elevation angle, the satellite dishes will be small, easy to install, and affordable.

All of these systems provide exciting glimpses into the future of the information age. At Teledesic, we are poised to begin serving the public. We are moving forward with construction, and have received most of the necessary authorizations from the FCC and the International Telecommunications Union ("ITU"), which regulates spectrum issues internationally. As we proceed with the exciting work of deploying our system, we hope that this Committee and the government in general will do what it can to promote policies that will, to use the language of section 706, "encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to *all* Americans." (emphasis added). That means that the government should promote a competitive telecommunications market in which regulatory hurdles are kept at a minimum, and technologies that promote universal access are encouraged to flourish. We hope that the government will help Teledesic succeed in its mission of extending the benefits of the advanced information infrastructure to all Americans, no matter where they choose to live.